

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau

(43) International Publication Date
31 December 2003 (31.12.2003)

PCT

(10) International Publication Number
WO 2004/002052 A1(51) International Patent Classification⁷: H04L 7/033(21) International Application Number:
PCT/CA2003/000909

(22) International Filing Date: 25 June 2003 (25.06.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2,389,969 25 June 2002 (25.06.2002) CA(71) Applicant and
(72) Inventor: BOGDAN, John, W. [CA/CA]; 1210 Major Street, Ottawa, Ontario K2C 2S2 (CA).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,

LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:

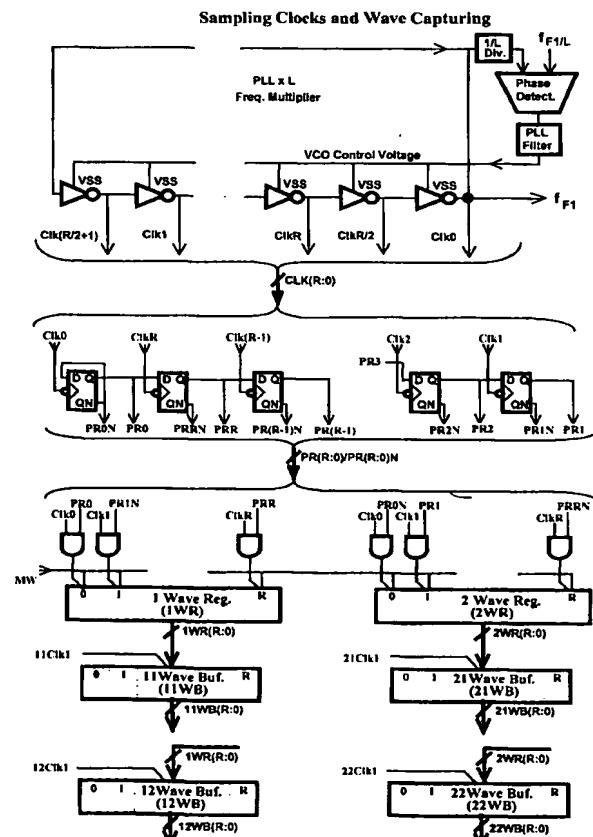
— of inventorship (Rule 4.17(iv)) for US only

Published:

— with international search report
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

[Continued on next page]

(54) Title: DIGITAL SIGNAL PROCESSING OF MULTI-SAMPLED PHASE



(57) Abstract: The DSP MSP invention provides an implementation of programmable algorithms for analyzing a very wide range of low and high frequency wave-forms. The DSP MSP comprises a synchronous sequential processor (SSP) for real time capturing and processing of in-coming wave-form and a programmable computing unit (PCU) for controlling SSP operations and supporting adaptive signal analysis algorithms. The DSP MSP further comprises a circuit for Sequential Data Recovery from Multi Sampled Phase (SDR MSP), for a receiver of an optical waveform.

WO 2004/002052 A1



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 03 909

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04L7/033

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS, COMPENDEX, EMBASE, FSTA, INSPEC, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 668 830 A (GEORGIOS CHRISTOS JOHN ET AL) 16 September 1997 (1997-09-16)	1, 2, 4-6, 20
Y	column 1, line 15 -column 9, line 21; claims 1-4; figures 2-8	3, 7-12, 15, 25, 41, 44, 67

X	US 2002/009171 A1 (RIBO JEROME) 24 January 2002 (2002-01-24)	1, 20, 22-24, 28, 61, 65
Y	the whole document	7-9, 11, 12, 15, 21, 25, 32, 33, 39-41, 44, 49, 51, 66, 67

		-/-

 Further documents are listed in the continuation of box C. Patent family members are listed in annex.

° Special categories of cited documents :

- °A° document defining the general state of the art which is not considered to be of particular relevance
- °E° earlier document but published on or after the international filing date
- °L° document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- °O° document referring to an oral disclosure, use, exhibition or other means
- °P° document published prior to the international filing date but later than the priority date claimed

°T° later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

°X° document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

°Y° document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

°&° document member of the same patent family

Date of the actual completion of the international search

18 November 2003

Date of mailing of the international search report

25/11/2003

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Koll, H

INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 03/009

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 977 582 A (ZELLE BRUCE R ET AL) 11 December 1990 (1990-12-11) column 2, line 50 -column 3, line 51; figure 23 column 11, line 41 -column 13, line 27 column 31, line 46 -column 35, line 41; claims 1-9; table 1 ---	1,29-31
Y	US 5 467 464 A (OPRESCU FLORIN ET AL) 14 November 1995 (1995-11-14) claims 1-3; figures 5-7,10 ---	21 3
Y	WO 01 91297 A (BOGDAN JOHN W) 29 November 2001 (2001-11-29) page 1 -page 6; claims 1-38; figures 1-14 ---	10,32, 33,39, 40,49, 51,66
Y	US 5 872 791 A (PROPP DAVID L ET AL) 16 February 1999 (1999-02-16) column 3, line 41 -column 10, line 55 ---	34-38
Y	EP 0 292 208 A (AMERICAN TELEPHONE & TELEGRAPH) 23 November 1988 (1988-11-23) page 2, line 35 -page 3, line 45; claims 1-9; figures 3-6 ---	34-38
A	EP 1 154 595 A (NIPPON ELECTRIC CO) 14 November 2001 (2001-11-14) paragraphs '0083!-'0099!; claims 1-3; figure 7 ---	1,29
A	EP 1 063 809 A (NIPPON ELECTRIC CO) 27 December 2000 (2000-12-27) claims 1-19; figure 1 ---	1,11,29, 44
A	EP 1 156 338 A (TEKTRONIX INC) 21 November 2001 (2001-11-21) paragraph '0008!; claims 1-16; figures 2,6,10,15 -----	1,29

INTERNATIONAL SEARCH REPORT
Information on patent family members

International Application No
PCT/CA 03 009

Patent document cited in search report	Publication date		Patent family member(s)	Publication date
US 5668830	A 16-09-1997	US	5550860 A	27-08-1996
		US	5533072 A	02-07-1996
		DE	69433157 D1	23-10-2003
		EP	0653860 A2	17-05-1995
US 2002009171	A1 24-01-2002	FR	2786632 A1	02-06-2000
US 4977582	A 11-12-1990	NONE		
US 5467464	A 14-11-1995	AU	6398594 A	26-09-1994
		DE	69428687 D1	22-11-2001
		DE	69428687 T2	20-06-2002
		EP	0688447 A1	27-12-1995
		JP	8507668 T	13-08-1996
		WO	9420898 A1	15-09-1994
WO 0191297	A 29-11-2001	AU	6195401 A	03-12-2001
		WO	0191297 A2	29-11-2001
		EP	1285498 A2	26-02-2003
		US	2002150191 A1	17-10-2002
US 5872791	A 16-02-1999	US	5727004 A	10-03-1998
		AU	707999 B2	29-07-1999
		AU	5250896 A	02-10-1996
		CA	2215380 A1	19-09-1996
		CN	1184537 A	10-06-1998
		DE	69625341 D1	23-01-2003
		DE	69625341 T2	18-06-2003
		EP	1244239 A2	25-09-2002
		EP	0815509 A1	07-01-1998
		JP	11502085 T	16-02-1999
		WO	9628779 A1	19-09-1996
		US	5944842 A	31-08-1999
EP 0292208	A 23-11-1988	US	4764941 A	16-08-1988
		CA	1323675 C	26-10-1993
		DE	3852521 D1	02-02-1995
		DE	3852521 T2	13-07-1995
		EP	0292208 A2	23-11-1988
		JP	1897269 C	23-01-1995
		JP	6026330 B	06-04-1994
		JP	64002432 A	06-01-1989
		KR	9200165 B1	09-01-1992
EP 1154595	A 14-11-2001	JP	2001320353 A	16-11-2001
		EP	1154595 A2	14-11-2001
		US	2002030522 A1	14-03-2002
EP 1063809	A 27-12-2000	EP	1063809 A2	27-12-2000
		JP	3246554 B2	15-01-2002
		JP	2001069127 A	16-03-2001
		US	6262611 B1	17-07-2001
EP 1156338	A 21-11-2001	EP	1156338 A2	21-11-2001
		JP	2002022773 A	23-01-2002
		US	2002147554 A1	10-10-2002